UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/851,675	05/09/2001	Jan Magnus Stensmo	ARC920000150US1	3256

7590	07/14/2004	EXAMINER
		ALBERTALLI, BRIAN LOUIS

John L. Rogitz
Rogitz & Associates
Suite 3120
750 B Street
San Diego, CA 92101

ART UNIT	PAPER NUMBER
2655	

DATE MAILED: 07/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	09/851,675	STENSMO, JAN MAGNUS
	Examiner	Art Unit	
	Brian L Albertalli	2655	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.
2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
   closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-27* is/are pending in the application.
   4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) *1-27* is/are rejected.
7)☐ Claim(s) _____ is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.
10)☒ The drawing(s) filed on <u>09 May 2001</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.
   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a)☐ All   b)☐ Some * c)☐ None of:
   1.☐ Certified copies of the priority documents have been received.
   2.☐ Certified copies of the priority documents have been received in Application No. _____.
   3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
      application from the International Bureau (PCT Rule 17.2(a)).
   * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
   Paper No(s)/Mail Date <u>05/09/01</u>.

4)☐ Interview Summary (PTO-413)
   Paper No(s)/Mail Date. _____.
5)☐ Notice of Informal Patent Application (PTO-152)
6)☐ Other: _____.

DETAILED ACTION

Specification

The disclosure is objected to because of the following informalities:

a)   Throughout the disclosure, such as page 2, line 7, errors of the type

"Abank@" should be –"a bank"--.

b)   On page 3, line 14, "word s" should be –words--.

c)   On page 5, line 8, "query 22" should be –query 20--.

d)   Throughout the disclosure, such as page 8, line 2, errors of the type

"Bayes=s" should be –Bayes's--.

e)   On page 12, line 7, "5,000documents" should be –5,000 documents--.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1.   Claims 1, 4, 13-15, 17, and 26 are rejected under 35 U.S.C. 102(b) as being

anticipated by Caid et al. (U.S. Patent 5,619,709).

In regard to claim 1, Caid et al. discloses a computer implemented method

(column 4, lines 45-65) for retrieving documents, comprising:

Inputting the text of one or more documents wherein each document includes human readable words (from training text, Fig. 1B, 101, column 6, lines 26-27);

Creating context windows around each word (target word, Figs. 2A-2F, 202) in each document (column 6, lines 27-52);

Generating a statistical evaluation of the characteristics of all the windows (by creating context vectors, column 6, line 53 – column 8, line 67). The statistical evaluation of the characteristics of the windows is not a function of the order of appearance of the words within each window (influence of a neighbor word to a target word is dependent on how close in position the neighbor is to the target, but not on their order of appearance, column 6, lines 53-62);

And combining the statistical evaluation for each window (context vectors are combined to create a document vector, column 9, lines 1-22).

2.   In regard to claim 4, Caid et al. discloses that pluralities of document categories are defined (bucket in a cluster tree) and the category of a particular document is based on the statistical evaluation for each window.

The statistical evaluation of each window creates a context vector. The context vectors are categorized by finding the bucket in a cluster tree that has the closest centroid to that particular document (column 10, lines 58-67 and column 11, lines 1-4).

3.   In regard to claim 13, Caid et al. discloses the step of creating context windows around each word further comprises the step of selecting the words appearing before

and after each word by a predetermined amount in the document and including those selected words in the window (Figs. 2A-2F and column 6, lines 33-36).

4.   In regard to claim 14, Caid et al. discloses the word around which each window created is not included in the window. Caid et al. discloses a window (Fig. 2A-2F, 204) is created around a target word (target 202). The window includes three neighbors (203) on each side of the word in around which each window is created (target 202). In reference to Figure 2A, Caid et al. discloses that the window (204) "only includes the three neighbor stems 203", and in reference to Figure 2F, "window 204 includes three neighbors 203 on each side of target 202", not the target 202.

5.   In regard to claim 15, Caid et al. discloses normalizing the combined results of the statistical evaluation for the windows (Fig. 4, 403 and column 9, lines 21-22).

6.   In regard to claim 17, Caid et al. discloses the step of combining includes averaging probability assessments (context vectors are combined by a weighted sum, fig. 4, 401 and 402, column 9, lines 11-15).

7.   In regard to claim 26, Caid et al. discloses a computer program storage device (Fig. 1, 112) and computer readable instructions on the storage device for causing a computer to undertake method acts to facilitate retrieving documents (column 4, lines 59-65), the method acts comprising:

Inputting the text of one or more documents wherein each document includes human readable words (from training text, Fig. 1B, 101, column 6, lines 26-27);

Creating context windows around each word (target word, Figs. 2A-2F, 202) in each document (column 6, lines 27-52);

Generating a statistical evaluation of the characteristics of all the windows (by creating context vectors, column 6, line 53 – column 8, line 67). The statistical evaluations of the characteristics of the windows are not a function of the order of appearance of the words within each window (influence of a neighbor word to a target word is dependent on how close in position the neighbor is to the target, but not the order of appearance, column 6, lines 53-62);

And combining the statistical evaluation for each window (context vectors are combined to create a document vector, column 9, lines 1-22).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8.   Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Caid et al.

In regard to claim 5, Caid et al. does not explicitly disclose determining the center of a particular window based on the combined statistical evaluation for each window.

Caid et al. does disclose that windows are created around a center word (Fig. 2F, column 6, lines 48-50). Furthermore, the statistical evaluation of the window (creation of a context vector) is performed to determine the context of the center word (column 6, lines 53-62).

Therefore, Caid et al. would strongly suggest to one of ordinary skill in the art at the time of invention that the center of a particular window could be determined based on the statistical evaluation for each window.

9.   Claims 2, 3, 6-12, 18-25, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Caid et al., in view of Hill (U.S. Patent 5,713,016).

In regard to claim 2, Caid et al. does not disclose determining the likelihood of documents having predetermined characteristics based on the statistical evaluation for each window.

Hill discloses a method of determining the relevance of a document based on the feature vector of a document. The method will determine the likelihood (log likelihood ratio) of a document (first document taken from a database of text documents) having a predetermined characteristic (query to be compared to first document, column 6, lines 1-5 and lines 11-28).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Caid et al. so document vectors based on the combined statistical evaluation of each window, as taught by Caid et al., would be used to determine the likelihood of those documents having predetermined characteristics, as taught by Hill,

so that the measure of relevance between two documents would not require any manual relevance feedback, as taught by Hill (column 5, lines 13-16).

In regard to claim 3, Caid et al. discloses assigning a document identifier to each document (document summary vector, Fig. 4, 404, column 9, lines 21-22) and context window (context vectors 106).

Caid et al. does not disclose determining the document identifier of at least one document having predetermined characteristics.

Hill discloses determining whether a document has predetermined characteristics (column 6, lines 1-5 and lines 11-28).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Caid et al. to determine whether a document has predetermined characteristics, as disclosed by Hill, in order to determine an appropriate measure of the relevance between the document and the predetermined characteristic, as taught by Hill (column 5, lines 13-16).

10.   In regard to claim 6, Caid et al. does not disclose counting the occurrences of particular words and tabulating totals of the counts.

Hill discloses that a statistical evaluation of a document is based on counting the occurrences of particular words and particular documents and tabulating totals of the counts (y_j is defined as the total number of times a word j occurs in a particular document and is used to define a context vector y, column 6, lines 13-14).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Caid et al. so the statistical evaluation used to create context vectors counted the occurrences of particular words and particular documents and tabulating totals of the counts, as taught by Hill, in order to provide a fast, automatic, and consistent statistically based method of comparing two documents, as taught by Hill (column 5, lines 5-7).

11.   In regard to claim 7, Caid et al. discloses that a statistical evaluation includes the step of generating word counts about pair-wise occurrences. A frequency function (Equation 3) includes a parameter F_j that is a count of the total number of pair-wise occurrences (the total number of occurrences of a neighboring word (stem) in a plurality of documents (corpus), column 6, lines 57-62 and column 7, lines 36-37).

Caid et al. does not disclose that a statistical evaluation includes the step of generating counts about singular word occurrences.

Hill discloses that a statistical evaluation of a document is based on counting the occurrences of particular words and particular documents and tabulating totals of the counts (y_j is defined as the total number of times a word j occurs in a particular document and is used to define a context vector y, column 6, lines 13-14).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Caid et al. so the statistical evaluation used to create context vectors counted the occurrences of particular words and particular documents and tabulating totals of the counts, as taught by Hill, in order to provide a fast, automatic, and

consistent statistically based method of comparing two documents, as taught by Hill (column 5, lines 5-7), and further refined that statistical evaluation by generating word counts of pair-wise occurrences, as taught by Caid et al.

12.   In regard to claim 8, Caid et al. discloses pruning the number of pair-wise counts. Caid et al. discloses that when generating context vectors to perform a statistical evaluation, words that have pair-wise occurrences (stems that appear several times in the corpus) of more than a certain amount, will not be counted (their context vectors will be approximated, rather than computed directly, column 22, lines 47-65).

13.   In regard to claim 9, Caid et al. discloses that pruning the number of pair-wise counts is much more efficient and provides "significant improvements in retrieval and routing performance" (column 23, ins 18-23). Furthermore, Caid et al. discloses that, while the creation of approximate context vectors reduces the amount of memory needed, the approximation introduces errors (column 19, lines 25-37).

Caid et al. does not specifically disclose monitoring the amount of memory used for the pair-wise counts and pruning when a predetermined threshold of memory has been exceeded for the pair-wise counts.

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Caid et al. to monitor the amount of memory being used for the pair-wise counts so that while there was enough memory available, the pair-wise counts would not be pruned, so the context vectors would be more accurate, and to prune the

number of pair-wise counts and make an approximation if a threshold of memory was exceeded, in order to reduce the amount of memory used.

14.   In regard to claim 10, Caid et al. does not disclose that the statistical evaluation includes the step of determining probabilities of particular words appearing in particular documents based on the counts.

Hill discloses that the probability (log likelihood) of a particular word appearing in a particular document is based on counts of particular words and particular documents (column 6, lines 11-28).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Caid et al. so the statistical evaluation determined the probability a particular word appeared in a particular document, as taught by Hill, so that an appropriate statistical model was used to assess the relevance between two documents, as taught by Hill (column 5, lines 8-12).

15.   In regard to claim 11, Caid et al. does not disclose that the statistical evaluation includes determining conditional probabilities of particular words appearing in particular documents based on the counts.

Hill discloses that the probability of a particular word appearing in a particular document is a conditional probability (log likelihood ratio, describes the conditional probability of y given x, column 6, lines 11-28).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Caid et al. so the statistical evaluation determined the conditional probability a particular word appeared in a particular document, as taught by Hill, so that a more specific statistical model describing statistical dependence was used to assess the relevance between two documents, as taught by Hill (column 5, lines 8-12).

16.   In regard claim 12, Caid et al. does not disclose the step of calculating a conditional probability is based on a Simple Bayes statistical model.

Hill discloses the calculation of the conditional probability is based on a Simple Bayes statistical model. In order to calculate the conditional probability (log likelihood probability of y given x), hyperparameters must be estimated by a Bayesian process (column 7, lines 49-67 and column 8, lines 1-18).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Caid et al. to calculate the conditional probability based on a Simple Bayes statistical model, as taught by Hill, so that appropriate statistical model parameters were used to assess the relevance between two documents, as taught by Hill (column 5, lines 8-12).

17.   In regard to claim 18, Caid et al. discloses a computer system comprising:

A storage unit for receiving and storing a plurality of documents, wherein each document includes human readable words (data storage 109, column 4, lines 55-57);

A means for creating context windows around each word in each document (learning system 105 creates context vectors by creating a window around each word in the document, column 6, lines 6-10 and lines 30-38);

A means for generating a statistical evaluation of the characteristics of each window (by creating context vectors, column 6, line 53 – column 8, line 67), wherein the order of the appearance of the words within each window is not used in the statistical evaluation (column 6, lines 53-62); and

A means for combining the statistical evaluation for each window (context vectors are combined to create a document vector, column 9, lines 1-22);

Caid et al. does not disclose a means for determining the probabilities of documents having predetermined characteristics based on the combined statistical evaluation for each window.

Hill discloses a means for determining the probabilities of documents having predetermined characteristics based on the combined statistical evaluation for each window (column 6, lines 1-5 and lines 11-28).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Caid et al. to include a means for determining the probabilities of documents having predetermined characteristics based on the combined statistical evaluation for each window, so that the measure of relevance between two documents would not require any manual relevance feedback, as taught by Hill (column 5, lines 13-16).

18.   In regard to claim 19, Caid et al. discloses assigning a document identifier to
each document (document summary vector, Fig. 4, 404, column 9, lines 21-22) and
context window (context vectors 106).

        Caid et al. does not disclose a means for determining the document identifier of
at least one document having predetermined characteristics.

        Hill discloses a means for determining whether a document has predetermined
characteristics (column 6, lines 1-5 and lines 11-28).

        It would have been obvious to one of ordinary skill in the art at the time of
invention to modify Caid et al. to include a means for determining whether a document
has predetermined characteristics, as disclosed by Hill, in order to determine an
appropriate measure of the relevance between the document and the predetermined
characteristic, as taught by Hill (column 5, lines 13-16).

19.   In regard to claim 20, Caid et al. discloses that pluralities of document categories
are defined (bucket in a cluster tree) and a means for determining the category of a
particular document is based on the statistical evaluation for each window.

        The statistical evaluation of each window creates a context vector. The context
vectors are categorized by finding the bucket in a cluster tree that has the closest
centroid to that particular document (column 10, lines 58-67 and column 11, lines 1-4).

20.   In regard to claim 21, Caid et al. does not explicitly disclose a means for

determining the center of a particular window based on the combined statistical

evaluation for each window.

Caid et al. does disclose that windows are created around a center word (Fig. 2F,

column 6, lines 48-50). Furthermore, the statistical evaluation of the window (creation

of a context vector) is performed to determine the context of the center word (column 6,

lines 53-62).

Therefore, Caid et al. would strongly suggest to one of ordinary skill in the art at

the time of invention that the center of a particular window could be determined based

on the statistical evaluation for each window.

21.   In regard to claim 22, Caid et al. does not disclose counting the occurrences of

particular words and tabulating totals of the counts.

Hill discloses that a statistical evaluation of a document is based on counting the

occurrences of particular words and particular documents and tabulating totals of the

counts (y_j is defined as the total number of times a word j occurs in a particular

document and is used to define a context vector y, column 6, lines 13-14).

It would have been obvious to one of ordinary skill in the art at the time of

invention to modify Caid et al. so the statistical evaluation used to create context vectors

counted the occurrences of particular words and particular documents and tabulating

totals of the counts, as taught by Hill, in order to provide a fast, automatic, and

consistent statistically based method of comparing two documents, as taught by Hill (column 5, lines 5-7).

22.   In regard to claim 23, Caid et al. does not disclose that the statistical evaluation includes a means for determining probabilities of particular words appearing in particular documents based on the counts.

Hill discloses a means for determining the probability (log likelihood) of a particular word appearing in a particular document is based on counts of particular words and particular documents (column 6, lines 11-28).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Caid et al. so the statistical evaluation determined the probability a particular word appeared in a particular document, as taught by Hill, so that an appropriate statistical model was used to assess the relevance between two documents, as taught by Hill (column 5, lines 8-12).

23.   In regard to claim 24, Caid et al. does not disclose that the statistical evaluation includes a means for determining conditional probabilities of particular words appearing in particular documents based on the counts.

Hill discloses that the probability of a particular word appearing in a particular document is a conditional probability (log likelihood ratio describes the conditional probability of y given x, column 6, lines 11-28).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Caid et al. so the statistical evaluation determined the conditional probability a particular word appeared in a particular document, as taught by Hill, so that a more specific statistical model describing statistical dependence was used to assess the relevance between two documents, as taught by Hill (column 5, lines 8-12).

24.   In regard to claim 25, Caid et al. discloses a means for creating context windows around each word further comprises means for selecting the words appearing before and after each word by a predetermined amount in the document and including those selected words in the window (Figs. 2A-2F and column 6, lines 33-36).

25.   In regard to claim 27, Caid et al. does not disclose determining the likelihood of documents having predetermined characteristics based on the statistical evaluation for each window.

Hill discloses a method of determining the relevance of a document based on the feature vector of a document. The method will determine the likelihood (log likelihood ratio) of a document (first document taken from a database of text documents) having a predetermined characteristic (query to be compared to first document, column 6, lines 1-5 and lines 11-28).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Caid et al. so document vectors based on the combined statistical evaluation of each window, as taught by Caid et al., would be used to determine the

likelihood of those documents having predetermined characteristics, as taught by Hill,

so that the measure of relevance between two documents would not require any

manual relevance feedback, as taught by Hill (column 5, lines 13-16).

26. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Caid et

al., in view of Dumais et al. (U.S. Patent 6,192,360).

Caid et al. does not disclose the step of evaluating includes determining a

measure of mutual information.

Dumais et al. discloses evaluating a given feature in a textual document by

determining a measure of mutual information (column 12, lines 59-67 and column 13,

lines 1-54).

It would have been obvious to one of ordinary skill in the art at the time of

invention to modify Caid et al., so that a measure of mutual information was determined

in the statistical evaluation of a window, so that windows (features) with the highest

mutual information values could be kept, while other windows (features) were not

considered, as taught by Dumais et al. (column 13, lines 47-54), thereby reducing the

amount of memory needed for the statistical evaluation.

Conclusion

The prior art made of record and not relied upon is considered pertinent to

applicant's disclosure. Kupiec et al. (U.S. Patent 5,918,240) discloses that a document

can be automatically summarized based on a simple Bayes statistical model. Gallant

(U.S. Patent 5,325,298) discloses a method of creating context vectors for each word in

a document and combining the vectors to create a document vector. McGreevy et al.

(U.S. Patent 6,741,981) discloses a method of creating context windows around each

word in a document and determining the relevancy of query based on a statistical

evaluation of the context windows. Luciw (U.S. Patent 5,434,777) discloses a method

of creating a context window around every word in a document to determine the

meaning of that document. Martino et al. (U.S. Patent 5,913,185) discloses a method of

creating context windows around every word in a document to determine a natural

language shift in that document. Turtle et al. (U.S. Patent 5,488,725) discloses a

system of document retrieval based on probabilities calculated from the frequency of

occurrence of a word in a document. Schuetze (U.S. Patent 5,675,819) discloses

creating document summaries based on the combination of context vectors for each
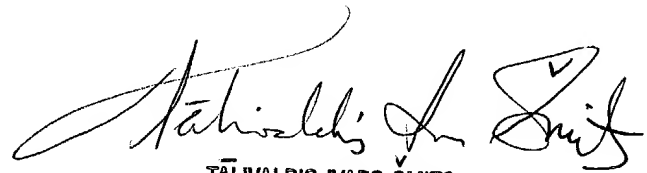
word in a document.

27.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Brian L Albertalli whose telephone number is (703) 305-

1817. The examiner can normally be reached on Monday - Friday, 8:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Talivaldis Smits can be reached on (703) 305-3011. The fax phone number

for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

BLA 7/9/04

TĀLIVALDIS IVARS SMITS
PRIMARY EXAMINER